## SEQUENCE LISTING

| <110> Hong Jin et al.   |    |
|---|----|
| <120> Recombinant RSV Expression Systems and Vaccines             |    |
| <130> 7682-045  | ٠. |
| <140> 09/161,122<br><141> 1998-09-25                              |    |
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| atattagttt ttgacacttt ttttctcgtt atagtgagtc gtatta             | 46  |

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| <400>            | 10  |    |
| agetta           | aatac gactcactat aacga                            | 25 |
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| -2237            |   |    |
| .400             |   |    |
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|                           | • | 17    |
| gtttaacacg tggtgag        | • |       |
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| · _                       | • |       |
| <br><220>                 |   |       |
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| ·                         |   |       |
| <400> 16                  |   | 17    |
| acatataggc atgcacc        |   | 1,    |
|                           |   | -     |
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| gcaaaacgga coccacc        |   |       |
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| <220>                     |   |       |
| <223> Primer              |   |       |
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| <400> 18                  |   |       |
| tggttggtat accagtgt       |   | 18    |
|                           |   |       |
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| <400> 19                  |   |       |
| taccaagagc tcgagtca       |   | 18    |
| cuccaayayo ceyayeea       |   |       |
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|                           |   |       |
| -226                      |   |       |

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|--|---|----------|----|---|
| <400> 20<br>ggtggccggc atggtcccag c    |   |          | 21 |   |
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| 1000 111                               |   |          |    |   |
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|  |   |          |    |   |
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| Met Asp Pro Ile Ile Asn Gly Asn Ser Ala Asn Val Tyr Leu Thr Asp  1 5 10 15     |    |
| Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly 20 25 30       |    |
| Ser Tyr Ile Phe Asn Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Leu 35 40 45       |    |
| Ile Ser Arg Gln Asn Pro Leu Ile Glu His Met Asn Leu Lys Lys Leu<br>50 55 60    | ,  |
| Asn Ile Thr Gln Ser Leu Ile Ser Lys Tyr His Lys Gly Glu Ile Lys<br>65 70 75 80 |    |
| Leu Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser<br>85 90 95    |    |
| Met Thr Ser Ser Glu Gln Ile Ala Thr Thr Asn Leu Leu Lys Lys Ile 100 105 110    |    |
| Ile Arg Arg Ala Ile Glu Ile Ser Asp Val Lys Val Tyr Ala Ile Leu<br>115 120 125 |    |

Asn Lys Leu Gly Leu Lys Glu Lys Asp Lys Ile Lys Ser Asn Asn Gly Gln Asp Glu Asp Asn Ser Val Ile Thr Thr Ile Ile Lys Asp Asp Ile Leu Ser Ala Val Lys Asp Asn Gln Ser His Leu Lys Ala Asp Lys Asn His Ser Thr Lys Gln Lys Asp Thr Ile Lys Thr Thr Leu Leu Lys Lys Leu Met Cys Ser Met Gln His Pro Pro Ser Trp Leu Ile His Trp Phe Asn Leu Tyr Thr Lys Leu Asn Asn Ile Leu Thr Gln Tyr Arg Ser Asn Glu Val Lys Asn His Gly Phe Thr Leu Ile Asp Asn Gln Thr Leu Ser 225 - - - - - - \_ \_ \_ \_ 230 \_ \_ \_ Gly Phe Gln Phe Ile Leu Asn Gln Tyr Gly Cys Ile Val Tyr His Lys Glu Leu Lys Arg Ile Thr Val Thr Thr Tyr Asn Gln Phe Leu Thr Trp Lys Asp Ile Ser Leu Ser Arg Leu Asn Val Cys Leu Ile Thr Trp Ile Ser Asn Cys Leu Asn Thr Leu Asn Lys Ser Leu Gly Leu Arg Cys Gly Phe Asn Asn Val Ile Leu Thr Gln Leu Phe Leu Tyr Gly Asp Cys Ile Leu Lys Leu Phe His Asn Glu Gly Phe Tyr Ile Ile Lys Glu Val Glu Gly Phe Ile Met Ser Leu Ile Leu Asn Ile Thr Glu Glu Asp Gln Phe Arg Lys Arg Phe Tyr Asn Ser Met Leu Asn Asn Ile Thr Asp Ala Ala Asn Lys Ala Gln Lys Asn Leu Leu Ser Arg Val Cys His Thr Leu Leu Asp Lys Thr Val Ser Asp Asn Ile Ile Asn Gly Arg Trp Ile Ile Leu Leu Ser Lys Phe Leu Lys Leu Ile Lys Leu Ala Gly Asp Asn Asn Leu Asn Asn Leu Ser Glu Leu Tyr Phe Leu Phe Arg Ile Phe Gly His Pro Met Val Asp Glu Arg Gln Ala Met Asp Ala Val Lys Ile Asn Cys Asn Glu Thr Lys Phe Tyr Leu Leu Ser Ser Leu Ser Met Leu Arg Gly Ala Phe Ile Tyr Arg Ile Ile Lys Gly Phe Val Asn Asn Tyr Asn Arg Trp Pro Thr Leu Arg Asn Ala Ile Val Leu Pro Leu Arg Trp Leu Thr Tyr Tyr Lys Leu Asn Thr Tyr Pro Ser Leu Leu Glu Leu Thr Glu Arg Asp Leu Ile Val Leu Ser Gly Leu Arg Phe Tyr Arg Glu Phe Arg Leu Pro Lys Lys Val Asp Leu Glu Met Ile Ile Asn Asp Lys Ala Ile Ser Pro Pro Lys Asn Leu Ile Trp Thr Ser Phe Pro Arg Asn Tyr Met Pro Ser His Ile Gln Asn Tyr Ile Glu His Glu Lys Leu Lys Phe Ser Glu Ser Asp Lys Ser Arg Arg Val Leu Glu Tyr Tyr Leu Arg Asp Asn Lys Phe Asn Glu Cys Asp Leu Tyr Asn Cys Val Val Asn Gln Ser Tyr Leu Asn Asn Pro Asn His Val Val Ser Leu Thr Gly Lys Glu Arg Glu Leu Ser Val Gly Arg Met Phe Ala Met Gln Pro Gly Met Phe Arg Gln Val Gln Ile Leu Ala Glu Lys Met Ile Ala Glu Asn Ile Leu Gln Phe Phe Pro Glu Ser Leu Thr Arg Tyr Gly Asp Leu Glu Leu Gln Lys Ile Leu Glu Leu Lys Ala Gly Ile Ser Asn Lys Ser Asn Arg Tyr Asn Asp Asn Tyr Asn Asn Tyr Ile Ser Lys Cys Ser Ile Ile Thr Asp Leu Ser Lys Phe Asn Gln Ala Phe Arg Tyr Glu Thr Ser Cys Ile Cys Ser Asp Val Leu-· 715 Asp Glu Leu His Gly Val Gln Ser Leu Phe Ser Trp Leu His Leu Thr Ile Pro His Val Thr Ile Ile Cys Thr Tyr Arg His Ala Pro Pro Tyr Ile Gly Asp His Ile Val Asp Leu Asn Asn Val Asp Glu Gln Ser Gly Leu Tyr Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp Thr Ile Glu Ala Ile Ser Leu Leu Asp Leu Ile Ser Leu Lys Gly Lys Phe Ser Ile Thr Ala Leu Ile Asn Gly Asp Asn Gln Ser Ile Asp Ile Ser Lys Pro Ile Arg Leu Met Glu Gly Gln Thr His Ala Gln Ala Asp Tyr Leu Leu Ala Leu Asn Ser Leu Lys Leu Leu Tyr Lys Glu Tyr Ala Gly Ile Gly His Lys Leu Lys Gly Thr Glu Thr Tyr Ile Ser Arg Asp Met Gln Phe Met Ser Lys Thr Ile Gln His Asn Gly Val Tyr Tyr Pro Ala Ser Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile Leu Asp Asp Phe Lys Val Ser Leu Glu Ser Ile Gly Ser Leu Thr Gln Glu Leu Glu Tyr Arg Gly Glu Ser Leu Leu Cys Ser Leu Ile Phe Arg Asn Val Trp Leu Tyr Asn Gln Ile Ala Leu Gln Leu Lys Asn His Ala Leu Cys Asn Asn Lys Leu Tyr Leu Asp Ile Leu Lys Val Leu Lys His Leu Lys Thr Phe Phe Asn Leu Asp Asn Ile Asp Thr Ala Leu Thr Leu Tyr Met Asn Leu Pro Met Leu Phe Gly Gly Asp Pro Asn Leu Leu Tyr Arg Ser Phe Tyr Arg Arg Thr Pro Asp Phe Leu Thr Glu Ala Ile Val His Ser Val Phe Ile Leu Ser Tyr Tyr Thr Asn His Asp Leu Lys Asp Lys Leu Gln Asp Leu Ser Asp Asp Arg Leu Asn Lys Phe Leu Thr Cys Ile Ile Thr Phe Asp Lys Asn Pro Asn Ala Glu Phe Val Thr 

| Leu Met Arg Asp Pro Gln Ala Leu Gly Ser Glu Arg Gln Ala Lys I<br>1060 1065 1070   |             |
|---|-------------|
| Thr Ser Glu Ile Asn Arg Leu Ala Val Thr Glu Val Leu Ser Thr A<br>1075 1080 1085   |             |
| Pro Asn Lys Ile Phe Ser Lys Ser Ala Gln His Tyr Thr Thr G<br>1090 1095 1100       |             |
| Ile Asp Leu Asn Asp Ile Met Gln Asn Ile Glu Pro Thr Tyr Pro H                     | 120         |
| Gly Leu Arg Val Val Tyr Glu Ser Leu Pro Phe Tyr Lys Ala Glu L<br>1125 1130 1135   |             |
| Ile Val Asn Leu Ile Ser Gly Thr Lys Ser Ile Thr Asn Ile Leu G<br>1140 1145 1150   |             |
| Lys Thr Ser Ala Ile Asp Leu Thr Asp Ile Asp Arg Ala Thr Glu M<br>1155 1160 1165   |             |
| Met Arg Lys Asn Ile Thr Leu Leu Ile Arg Ile Leu Pro Leu Asp C                     | ys -        |
| 1170 1175 1180 1175 1180 Ton Con Tio  | 1h ~        |
| Asn Arg Asp Lys Arg Glu Ile Leu Ser Met Glu Asn Leu Ser Ile T<br>1185 1190 1195 1 | 200         |
| 1185 1190 1195 1195 1195 1195 1195 1195 119                                       |             |
| 1205 1210 1215  |             |
| Val Gly Val Thr Ser Pro Ser Ile Met Tyr Thr Met Asp Ile Lys T                     | yr          |
| Thr Thr Ser Thr Ile Ser Ser Gly Ile Ile Ile Glu Lys Tyr Asn V                     | al          |
| Asn Ser Leu Thr Arg Gly Glu Arg Gly Pro Thr Lys Pro Trp Val G                     | ly          |
| 1250 1255 1260  |             |
| Ser Ser Thr Gln Glu Lys Lys Thr Met Pro Val Tyr Asn Arg Gln V                     | 7al<br>L280 |
| · 1200  |             |
| Leu Thr Lys Lys Gln Arg Asp Gln Ile Asp Leu Leu Ala Lys Leu F<br>1285 1290 1295   | .op         |
| Trp Val Tyr Ala Ser Ile Asp Asn Lys Asp Glu Phe Met Glu Glu I<br>1300 1305 1310   | .eu         |
| Ser Ile Gly Thr Leu Gly Leu Thr Tyr Glu Lys Ala Lys Lys Leu I<br>1315 1320 1325   | ?he         |
| Pro Gln Tyr Leu Ser Val Asn Tyr Leu His Arg Leu Thr Val Ser S                     | er          |
| 1330 1340   |             |
| Arg Pro Cys Glu Phe Pro Ala Ser Ile Pro Ala Tyr Arg Thr Thr                       | Asn         |
| 1345 1350 1355 Tyr His Phe Asp Thr Ser Pro Ile Asn Arg Ile Leu Thr Glu Lys 3      | 1360        |
| 1365 1370 1375  |             |
| Gly Asp Glu Asp Ile Asp Ile Val Phe Gln Asn Cys Ile Ser Phe G                     | Зlу         |
| 1380 1385 1390  Leu Ser Leu Met Ser Val Val Glu Gln Phe Thr Asn Val Cys Pro A     | Asn         |
| 1395 1400 1405  |             |
| Arg Ile Ile Leu Ile Pro Lys Leu Asn Glu Ile His Leu Met Lys                       | Pro         |
| 1410 1415 1420  |             |
| Pro Ile Phe Thr Gly Asp Val Asp Ile His Lys Leu Lys Gln Val                       | Ile         |
| 1425 1430 2100  | 1440<br>Tur |
| Gln Lys Gln His Met Phe Leu Pro Asp Lys Ile Ser Leu Thr Gln 1445 1450 1455        | -7-         |
| Val Glu Leu Phe Leu Ser Asn Lys Thr Leu Lys Ser Gly Ser His                       | Val         |
| 1460 1465 1470<br>Asn Ser Asn Leu Ile Leu Ala His Lys Ile Ser Asp Tyr Phe His     |             |
| 1475 1480 1485  |             |
| Thr Tyr Ile Leu Ser Thr Asn Leu Ala Gly His Trp Ile Leu Ile 1490 1495 1500        | тте         |
|   |             |
| Gln Leu Met Lys Asp Ser Lys Gly Ile Phe Glu Lys Asp Trp Gly                       | Glu         |
| Gln Leu Met Lys Asp Ser Lys Gly Ile Phe Glu Lys Asp Trp Gly                       |             |

| Gly Tyr Ile T         | 1525                |                 | 1530              |                 |                 | 1535              |
|-----------------------|---------------------|-----------------|-------------------|-----------------|-----------------|-------------------|
| Ala Tyr Lys T         | L540                | :               | 1545              | •               | 1550            |                   |
| Lys Leu Glu C         | Cys Asp Met         | Asn Thr 3       |                   | Leu Leu         | Cys Val         | Leu Glu           |
| Leu Ile Asp S<br>1570 | Ser Ser Tyr         | Trp Lys :       | Ser Met S         | Ser Lys<br>1580 |                 | Leu Glu           |
| Gln Lys Val I         | 1590                | )               | :                 | 1595            | . 0             | 1600              |
| Val Lys Gly (         | Cys His Ser<br>1605 | Phe Lys         | Leu Trp 1<br>1610 | Phe Leu         | Lys Arg         | Leu Asn<br>1615   |
| Val Ala Glu I         | Phe Thr Val         |                 | 1625              |                 | 163             | 0                 |
| Pro Thr His N         | Met Lys Ala         | Ile Leu         | Thr Tyr           | īle Asp         | Leu Val         | Arg Met -         |
| 1635                  |                     | 1640            |                   |                 | 1645            |                   |
| Gly Leu Ile A         |                     | 1655            |                   | 1660            | )               |                   |
| Asn Asp Glu I         | Phe Tyr Thr<br>1670 |                 | Leu Phe '         | Tyr Ile<br>1675 | Asn Tyr         | Asn Phe<br>1680   |
| Ser Asp Asn 5         |                     |                 | Lys His           | Ile Arg         | Ile Ala         | Asn Ser           |
|                       | 1685                |                 | 1690              |                 |                 | 1695              |
| Glu Leu Glu A         | 1700                |                 | 1705              |                 | 171             | 0                 |
| Leu Glu Asn           |                     | 1720            |                   |                 | 1725            |                   |
| Leu Asn Asp           | Tyr Cys Ile         |                 | Asn Val           | Asp Ser         | Ile Met         | Leu Pro           |
| 1730                  |                     | 1735            | _                 | 174             |                 | North Mines       |
| Leu Leu Ser           | Asn Lys Lys<br>175  |                 |                   | Ser Ala<br>1755 | Met lie         | 1760              |
| 1745<br>Asn Tyr Ser   |                     |                 |                   |                 | Met Val         |                   |
| Abii Iyi bei .        | 1765                |                 | 1770              |                 |                 | 1775              |
| Asp Arg Ile           | Ile Asp His<br>1780 | Ser Gly         | Asn Thr           | Ala Lys         | Ser Asn<br>179  |                   |
| Tyr Thr Thr           | Thr Ser His         | Gln Ile<br>1800 |                   | Val His         | Asn Ser<br>1805 | Thr Ser           |
| Leu Tyr Cys           |                     |                 |                   | Asn Arg         |                 | Phe Val           |
| 1810                  |                     | 1815            |                   | 182             | 0               |                   |
| Phe Ser Ser           |                     |                 |                   |                 | Ile Leu         | Lys Asp           |
| 1825                  | 183                 |                 |                   | 1835            | G1 G1.          | 1840              |
| Leu Lys Ile           | 1845                |                 | 1850              | )               |                 | 1855              |
|                       | 1860                |                 | 1865              |                 | 187             | 0                 |
| Tyr Ile Tyr<br>1875   |                     | Lys Asp<br>1880 | Cys Asn           | Asp His         | Ser Leu<br>1885 | Pro Ile           |
| Glu Phe Leu<br>1890   |                     |                 |                   | Asn Ile         |                 | Gly Glu           |
| Asn Leu Thr           | Ile Pro Ala         |                 | Ala Thr           |                 |                 | Trp Ser           |
| 1905                  | 191                 |                 |                   | 1915            |                 | 1920              |
| Tyr Leu His           | Ile Lys Phe<br>1925 | Ala Glu         | Pro Ile<br>1930   |                 | Phe Val         | . Cys Asp<br>1935 |
| Ala Glu Leu           | Ser Val Thr         | Val Asn         |                   |                 | Ile Ile<br>195  | Glu Trp           |
| Ser Lys His           | Val Arg Lys         |                 | Tyr Cys           | Ser Ser         |                 |                   |
| 1955<br>Met Leu Ile   | )<br>Val tare ጥነጥ   | 1960<br>His Ala |                   | Asp Ile         |                 | Lys Leu           |
| 1970                  | ANT THE TAT         | 1975            | P                 | 198             | 0               | -                 |

Asp Asn Ile Thr Ile Leu Lys Thr Tyr Val Cys Leu Gly Ser Lys Leu 1995 1985 1990 Lys Gly Ser Glu Val Tyr Leu Val Leu Thr Ile Gly Pro Ala Asn Ile 2005 2010 Phe Pro Val Phe Asn Val Val Gln Asn Ala Lys Leu Ile Leu Ser Arg 2025 Thr Lys Asn Phe Ile Met Pro Lys Lys Ala Asp Lys Glu Ser Ile Asp 2035 2040 Ala Asn Ile Lys Ser Leu Ile Pro Phe Leu Cys Tyr Pro Ile Thr Lys 2055 2060 Lys Gly Ile Asn Thr Ala Leu Ser Lys Leu Lys Ser Val Val Ser Gly 2075 2070 Asp Ile Leu Ser Tyr Ser Ile Ala Gly Arg Asn Glu Val Phe Ser Asn 2090 .-- \_ \_ 2.085\_ \_ \_ Lys Leu Ile Asn His Lys His Met Asn Ile Leu Lys Trp Phe Asn His 2110 2100 2105 Val Leu Asn Phe Arg Ser Thr Glu Leu Asn Tyr Asn His Leu Tyr Met 2120 2115 Val Glu Ser Thr Tyr Pro Tyr Leu Ser Glu Leu Leu Asn Ser Leu Thr 2140 2135 2130 Thr Asn Glu Leu Lys Lys Leu Ile Lys Ile Thr Gly Ser Leu Leu Tyr 2150 2155 Asn Phe His Asn Glu

<210> 30 <211> 2165 <212> PRT <213> Virus

195

<400> 30 Met Asp Pro Ile Ile Asn Gly Asn Ser Ala Asn Val Tyr Leu Thr Asp 10 Ser Tyr Leu Lys Gly Val Ile Ser Phe Ser Glu Cys Asn Ala Leu Gly 25 20 Ser Tyr Ile Phe Asn Gly Pro Tyr Leu Lys Asn Asp Tyr Thr Asn Leu 40 Ile Ser Arg Gln Asn Pro Leu Ile Glu His Met Asn Leu Lys Lys Leu Asn Ile Thr Gln Ser Leu Ile Ser Lys Tyr His Lys Gly Glu Ile Lys 75 70 Leu Glu Glu Pro Thr Tyr Phe Gln Ser Leu Leu Met Thr Tyr Lys Ser 90 85 Met Thr Ser Ser Glu Gln Ile Ala Thr Thr Asn Leu Leu Lys Lys Ile 110 105 Ile Arg Arg Ala Ile Glu Ile Ser Asp Val Lys Val Tyr Ala Ile Leu 125 120 Asn Lys Leu Gly Leu Lys Glu Lys Asp Lys Ile Lys Ser Asn Asn Gly 135 140 Gln Asp Glu Asp Asn Ser Val Ile Thr Thr Ile Ile Lys Asp Asp Ile 150 Leu Ser Ala Val Lys Asp Asn Gln Ser His Leu Lys Ala Asp Lys Asn 170 165 His Ser Thr Lys Gln Lys Asp Thr Ile Lys Thr Thr Leu Leu Lys Lys 185 Leu Met Cys Ser Met Gln His Pro Pro Ser Trp Leu Ile His Trp Phe

200

Asn Leu Tyr Thr Lys Leu Asn Asn Ile Leu Thr Gln Tyr Arg Ser Asn Glu Val Lys Asn His Gly Phe Thr Leu Ile Asp Asn Gln Thr Leu Ser Gly Phe Gln Phe Ile Leu Asn Gln Tyr Gly Cys Ile Val Tyr His Lys Glu Leu Lys Arg Ile Thr Val Thr Thr Tyr Asn Gln Phe Leu Thr Trp Lys Asp Ile Ser Leu Ser Arg Leu Asn Val Cys Leu Ile Thr Trp Ile Ser Asn Cys Leu Asn Thr Leu Asn Lys Ser Leu Gly Leu Arg Cys Gly Phe Asn Asn Val Ile Leu Thr Gln Leu Phe Leu Tyr Gly Asp Cys Ile Leu Lys Leu Phe His Asn Glu Gly Phe Tyr Ile Ile Lys Glu Val Glu-Gly Phe Ile Met Ser Leu Ile Leu Asn Ile Thr Glu Glu Asp Gln Phe Arg Lys Arg Phe Tyr Asn Ser Met Leu Asn Asn Ile Thr Asp Ala Ala Asn Lys Ala Gln Lys Asn Leu Leu Ser Arg Val Cys His Thr Leu Leu Asp Lys Thr Val Ser Asp Asn Ile Ile Asn Gly Arg Trp Ile Ile Leu Leu Ser Lys Phe Leu Lys Leu Ile Lys Leu Ala Gly Asp Asn Asn Leu Asn Asn Leu Ser Glu Leu Tyr Phe Leu Phe Arg Ile Phe Gly His Pro Met Val Asp Glu Arg Gln Ala Met Asp Ala Val Lys Ile Asn Cys Asn Glu Thr Lys Phe Tyr Leu Leu Ser Ser Leu Ser Met Leu Arg Gly Ala Phe Ile Tyr Arg Ile Ile Lys Gly Phe Val Asn Asn Tyr Asn Arg Trp Pro Thr Leu Arg Asn Ala Ile Val Leu Pro Leu Arg Trp Leu Thr Tyr Tyr Lys Leu Asn Thr Tyr Pro Ser Leu Leu Glu Leu Thr Glu Arg Asp Leu Ile Val Leu Ser Gly Leu Arg Phe Tyr Arg Glu Phe Arg Leu Pro Lys Lys Val Asp Leu Glu Met Ile Ile Asn Asp Lys Ala Ile Ser Pro Pro Lys Asn Leu Ile Trp Thr Ser Phe Pro Arg Asn Tyr Met Pro Ser His Ile Gln Asn Tyr Ile Glu His Glu Lys Leu Lys Phe Ser Glu Ser Asp Lys Ser Arg Arg Val Leu Glu Tyr Tyr Leu Arg Asp Asn Lys Phe Asn Glu Cys Asp Leu Tyr Asn Cys Val Val Asn Gln Ser Tyr Leu Asn Asn Pro Asn His Val Val Ser Leu Thr Gly Lys Glu Arg Glu Leu Ser Val Gly Arg Met Phe Ala Met Gln Pro Gly Met Phe Arg Gln Val Gln Ile Leu Ala Glu Lys Met Ile Ala Glu Asn Ile Leu Gln Phe Phe Pro Glu Ser Leu Thr Arg Tyr Gly Asp Leu Glu Leu Gln Lys Ile Leu Glu 

Leu Lys Ala Gly Ile Ser Asn Lys Ser Asn Arg Tyr Asn Asp Asn Tyr Asn Asn Tyr Ile Ser Lys Cys Ser Ile Ile Thr Asp Leu Ser Lys Phe Asn Gln Ala Phe Arg Tyr Glu Thr Ser Cys Ile Cys Ser Asp Val Leu Asp Glu Leu His Gly Val Gln Ser Leu Phe Ser Trp Leu His Leu Thr Ile Pro His Val Thr Ile Ile Cys Thr Tyr Arg His Ala Pro Pro Tyr Ile Gly Asp His Ile Val Asp Leu Asn Asn Val Asp Glu Gln Ser Gly Leu Tyr Arg Tyr His Met Gly Gly Ile Glu Gly Trp Cys Gln Lys Leu Trp Thr Ile Glu Ala Ile Ser Leu Leu Asp Leu Ile Ser Leu Lys Gly Lys Phe Ser Ile Thr Ala Leu Ile Asn Gly Asp Asn Gln Ser Ile Asp Ile Ser Lys Pro Ile Arg Leu Met Glu Gly Gln Thr His Ala Gln Ala Asp Tyr Leu Leu Ala Leu Asn Ser Leu Lys Leu Leu Tyr Lys Glu Tyr Ala Gly Ile Gly His Lys Leu Lys Gly Thr Glu Thr Tyr Ile Ser Arg Asp Met Gln Phe Met Ser Lys Thr Ile Gln His Asn Gly Val Tyr Tyr Pro Ala Ser Ile Lys Lys Val Leu Arg Val Gly Pro Trp Ile Asn Thr Ile Leu Asp Asp Phe Lys Val Ser Leu Glu Ser Ile Gly Ser Leu Thr Gln Glu Leu Glu Tyr Arg Gly Glu Ser Leu Leu Cys Ser Leu Ile Phe Arg Asn Val Trp Leu Tyr Asn Gln Ile Ala Leu Gln Leu Lys Asn His Ala Leu Cys Asn Asn Lys Leu Tyr Leu Asp Ile Leu Lys Val Leu Lys His Leu Lys Thr Phe Phe Asn Leu Asp Asn Ile Asp Thr Ala Leu Thr Leu Tyr Met Asn Leu Pro Met Leu Phe Gly Gly Asp Pro Asn Leu Leu Tyr Arg Ser Phe Tyr Arg Arg Thr Pro Asp Phe Leu Thr Glu Ala Ile Val His Ser Val Phe Ile Leu Ser Tyr Tyr Thr Asn His Asp Leu Lys Asp Lys Leu Gln Asp Leu Ser Asp Asp Arg Leu Asn Lys Phe Leu Thr Cys Ile Ile Thr Phe Asp Lys Asn Pro Asn Ala Glu Phe Val Thr Leu Met Arg Asp Pro Gln Ala Leu Gly Ser Glu Arg Gln Ala Lys Ile Thr Ser Glu Ile Asn Arg Leu Ala Val Thr Glu Val Leu Ser Thr Ala Pro Asn Lys Ile Phe Ser Lys Ser Ala Gln His Tyr Thr Thr Glu Ile Asp Leu Asn Asp Ile Met Gln Asn Ile Glu Pro Thr Tyr Pro His Gly Leu Arg Val Val Tyr Glu Ser Leu Pro Phe Tyr Lys Ala Glu Lys 

| ~ 7 -  |  |   |   |   |  |  |  |  |   |   |  |   |   |   |   |
|--|--|---|---|---|--|--|--|--|---|---|--|---|---|---|---|
| 116  | Val  | Asn   | Leu<br>1140   |   | Ser  | Gly  |  | Lys<br>1145  |   | Ile   |  |   | Ile<br>1150   |   | Glu   |
| Lys  |  |   | Ala   |   | Asp  | Leu  | Thr  | Asp  | Ile   | Asp   | Arg  | Ala   | Thr   |   | Met   |
|  |  | 1155  |   |   |  |  | 1160   |  |   |   |  | 1165  |   |   |   |
| Met  | Arg  | Lys   | Asn   | Ile   | Thr  | Leu  | Leu  | Ile  | Arg   | Ile   | Leu  | Pro   | Leu   | Asp   | Cys   |
| ,  | 1170   | ) _   |   |   |  | 1175   | ;  |  |   |   | 1180   | )   |   |   |   |
| Agn  |  |   | Lys   | Ara   | Glu  | Tle  | Len  | Ser  | Met   | Glu   | Asn  | Leu   | Ser   | Ile   | Thr   |
| 1185   |  | LLOP  | 270   |   | 1190   |  |  |  |   | 1195  |  |   |   |   | 1200  |
| 1102   | •  |   | Lys   | <b>—</b>  | 1120   | 3  | <b>a</b> 1   | 7  |   |   |  | T.011   | Ser   | Aen .   |   |
| GIU  | ьeu  | ser   | гув   |   |  | Arg  | GIU  | Arg  | ser   | TIP   | PET  | пец   | 261   | 1016  |   |
|  |  |   |   | 1205  |  |  | _  |  | 1210  |   |  | _   |   | 1215  |   |
| Val  | Gly  | Val   | Thr   | Ser   | Pro  | Ser  | Ile  | Met  | Tyr   | Thr   | Met  | Asp   |   |   | TYT   |
|  |  |   | 1220  |   |  |  |  | 1225   |   |   |  |   | 1230  |   |   |
| Thr  | Thr  | Ser   | Thr   | Ile   | Ser  | Ser  | Gly  | Ile  | Ile   | Ile   | Glu  | Lys   | Tyr   | Asn   | Val   |
|  |  | 1.224   | =   |   |  |  | 1240   | )  |   |   |  | 1245  | ,   |   |   |
| Asn  | Ser  | Leu   | Thr   | Ara   | Glv  | Glu  | Ara  | Glv  | Pro   | Thr   | Lys  | Pro   | Trp   | Val   | Gly ·   |
|  | 1250   |   |   | 5   |  | 1255   | ;  | •  |   |   | 1260   | )   | _   |   |   |
| Sar  |  |   | Gln   | Glu   | Tare   |  |  | Met  | Pro   | Val   |  |   | Ara   | Gln   | Val   |
|  |  | THE   | GIII  | Gru   |  |  | 1111   | rice   | 110   | 1275  |  | *****   |   |   | 1280  |
| 1265   |  | _   | _   |   | 1270   | ,  | ~7 -   | -1-  | 3   |   |  | 21-   |   | T 011   |   |
| Leu  | Thr  | Lys   | Lys   |   |  | Asp  | Gin  | 11e  |   |   | reu  | ALA   | ոչո   | neu   | Asp   |
|  |  |   |   | 1285  |  |  |  |  | 1290  |   |  |   | _   | 1295  |   |
| Trp  | Val  | Tyr   | Ala   | Ser   | Ile  | Asp  | Asn  | Lys  | Asp   | Glu   | Phe  | Met   | Glu   | Glu   | Leu   |
|  |  |   | 1300  |   |  |  |  | 1305   |   |   |  |   | 1310  |   |   |
| Ser  | Ile  | Glv   | Thr   | Leu   | Gly  | Leu  | Thr  | Tyr  | Glu   | Lys   | Ala  | Lys   | Lys   | Leu   | Phe   |
|  |  | 131   |   |   |  |  | 1320   |  |   | -   |  | 1325  |   |   |   |
| Dro  | Gln  |   | Leu   | Ser   | Val  | Δen  |  |  | His   | Ara   | Leu  | Thr   | Val   | Ser   | Ser   |
| PIO  |  |   | neu   | BCI   | VAI  | 133  |  |  |   | 9   | 1340   |   |   |   |   |
|  | 1330   |   | <b>61</b>   | <b>n</b> -  | <b>D</b>   |  |  | <b>-1</b> -  | D=0   | 77-   |  |   | Thr   | Thr   | Acn   |
| _  |  | Cys   | Glu   | Pne   |  |  | ser  | TIE  | PIO   |   |  | Arg   | TILL  | TIIL  |   |
| 134  |  |   |   |   | 1350   |  | _  |  | _   | 135   |  |   |   | <b>-</b>  | 1360  |
| Tyr  | His  | Phe   | Asp   | Thr   | Ser  | Pro  | Ile  | Asn  |   |   | Leu  | Thr   | GIu   |   |   |
|  |  |   |   | 1365  |  |  |  |  | 1370  |   |  |   |   | 1375  |   |
|  |  |   |   |   |  |  |  |  |   |   |  |   |   |   |   |
| Gly  | Asp  | Glu   | Asp   | Ile   | Asp  | Ile  | Val  | Phe  | Gln   | Asn   | Cys  | Ile   | Ser   | Phe   | Gly   |
| _  |  |   | 1380  | )   |  |  |  | 138  | 5   |   |  |   | 1390  | 3   |   |
| _  |  |   | 1380  | )   |  |  |  | 138  | 5   |   |  |   | 1390  | 3   |   |
| _  |  | Leu   | 1386<br>Met   | )   |  |  | Glu  | 1389<br>Gln  | 5   |   |  |   | 1390<br>Cys   | 3   |   |
| Leu  | Ser  | Leu<br>139  | 1380<br>Met<br>5  | )<br>Ser  | Val  | Val  | Glu<br>140   | 1389<br>Gln<br>O   | Phe   | Thr   | Asn  | Val   | 1390<br>Cys   | Pro   | Asn   |
| Leu  | Ser<br>Ile   | Leu<br>139<br>Ile   | 1386<br>Met   | )<br>Ser  | Val  | Val<br>Lys   | Glu<br>140<br>Leu  | 1389<br>Gln<br>O   | Phe   | Thr   | Asn<br>His   | Val<br>1405<br>Leu  | 1390<br>Cys   | Pro   | Asn   |
| Leu<br>Arg   | Ser<br>Ile   | Leu<br>139<br>Ile<br>0  | 1380<br>Met<br>5<br>Leu   | Ser<br>Ile  | Val<br>Pro   | Val<br>Lys<br>141  | Glu<br>140<br>Leu<br>5   | 1389<br>Gln<br>O<br>Asn  | Phe<br>Glu  | Thr<br>Ile  | Asn<br>His   | Val<br>1405<br>Leu  | 1390<br>Cys<br>Met  | Pro<br>Lys  | Asn<br>Pro  |
| Leu<br>Arg<br>Pro  | Ser<br>Ile<br>141  | Leu<br>139<br>Ile<br>0  | 1380<br>Met<br>5  | Ser<br>Ile  | Val<br>Pro<br>Asp  | Val<br>Lys<br>141<br>Val   | Glu<br>140<br>Leu<br>5   | 1389<br>Gln<br>O<br>Asn  | Phe<br>Glu  | Thr<br>Ile<br>Lys   | Asn<br>His<br>1420<br>Leu  | Val<br>1405<br>Leu  | 1390<br>Cys<br>Met  | Pro<br>Lys  | Asn<br>Pro<br>Ile   |
| Leu<br>Arg<br>Pro  | Ser<br>Ile<br>1410<br>Ile  | Leu<br>139<br>Ile<br>O<br>Phe   | 1380<br>Met<br>5<br>Leu<br>Thr                                  | Ser<br>Ile<br>Gly   | Val<br>Pro<br>Asp<br>143   | Val<br>Lys<br>141!<br>Val  | Glu<br>140<br>Leu<br>5<br>Asp  | 138!<br>Gln<br>O<br>Asn<br>Ile                                     | 5<br>Phe<br>Glu<br>His                                  | Thr<br>Ile<br>Lys<br>143  | Asn<br>His<br>1420<br>Leu<br>5                                   | Val<br>1409<br>Leu<br>O<br>Lys                                      | 1390<br>Cys<br>Met  | Pro<br>Lys<br>Val   | Asn<br>Pro<br>Ile<br>1440   |
| Leu<br>Arg<br>Pro  | Ser<br>Ile<br>1410<br>Ile  | Leu<br>139<br>Ile<br>O<br>Phe   | 1380<br>Met<br>5<br>Leu   | Ser<br>Ile<br>Gly<br>Met  | Val<br>Pro<br>Asp<br>143<br>Phe  | Val<br>Lys<br>141!<br>Val  | Glu<br>140<br>Leu<br>5<br>Asp  | 138!<br>Gln<br>O<br>Asn<br>Ile                                     | Phe<br>Glu<br>His<br>Lys                                | Thr<br>Ile<br>Lys<br>143<br>Ile   | Asn<br>His<br>1420<br>Leu<br>5                                   | Val<br>1409<br>Leu<br>O<br>Lys                                      | 1390<br>Cys<br>Met  | Pro<br>Lys<br>Val<br>Gln                                  | Asn<br>Pro<br>Ile<br>1440<br>Tyr                                  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln                         | Ser<br>Ile<br>1410<br>Ile<br>5<br>Lys                            | Leu<br>139<br>Ile<br>O<br>Phe<br>Gln                                      | 1380<br>Met<br>5<br>Leu<br>Thr                                  | Ser<br>Ile<br>Gly<br>Met  | Val<br>Pro<br>Asp<br>143<br>Phe  | Val<br>Lys<br>141!<br>Val<br>0<br>Leu                                    | Glu<br>1400<br>Leu<br>5<br>Asp   | 1389<br>Gln<br>O<br>Asn<br>Ile<br>Asp                              | Phe<br>Glu<br>His<br>Lys<br>145                         | Thr<br>Ile<br>Lys<br>143<br>Ile   | Asn<br>His<br>1420<br>Leu<br>5<br>Ser                            | Val<br>1409<br>Leu<br>O<br>Lys<br>Leu                               | 1390<br>Cys<br>Met<br>Gln   | Pro Lys Val Gln 145!                                      | Asn Pro Ile 1440 Tyr  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln                         | Ser<br>Ile<br>1410<br>Ile<br>5<br>Lys                            | Leu<br>139<br>Ile<br>O<br>Phe<br>Gln                                      | 1380<br>Met<br>5<br>Leu<br>Thr                                  | Ser<br>Ile<br>Gly<br>Met  | Val<br>Pro<br>Asp<br>143<br>Phe  | Val<br>Lys<br>141!<br>Val<br>0<br>Leu                                    | Glu<br>1400<br>Leu<br>5<br>Asp   | 1389<br>Gln<br>O<br>Asn<br>Ile<br>Asp                              | Phe<br>Glu<br>His<br>Lys<br>145                         | Thr<br>Ile<br>Lys<br>143<br>Ile   | Asn<br>His<br>1420<br>Leu<br>5<br>Ser                            | Val<br>1409<br>Leu<br>O<br>Lys<br>Leu                               | 1390<br>Cys<br>Met<br>Gln   | Pro Lys Val Gln 145!                                      | Asn Pro Ile 1440 Tyr  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln                         | Ser<br>Ile<br>1410<br>Ile<br>5<br>Lys                            | Leu<br>139<br>Ile<br>O<br>Phe<br>Gln                                      | 1380<br>Met<br>5<br>Leu<br>Thr                                  | Ser<br>Ile<br>Gly<br>Met<br>144!<br>Leu   | Val<br>Pro<br>Asp<br>143<br>Phe  | Val<br>Lys<br>141!<br>Val<br>0<br>Leu                                    | Glu<br>1400<br>Leu<br>5<br>Asp   | 1389<br>Gln<br>O<br>Asn<br>Ile<br>Asp                              | Phe<br>Glu<br>His<br>Lys<br>145                         | Thr<br>Ile<br>Lys<br>143<br>Ile   | Asn<br>His<br>1420<br>Leu<br>5<br>Ser                            | Val<br>1409<br>Leu<br>Lys<br>Leu<br>Gly                             | 1390<br>Cys<br>Met<br>Gln   | Pro Lys Val Gln 145!                                      | Asn Pro Ile 1440 Tyr  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln<br>Val                  | Ser Ile 1410 Ile 5 Lys Glu                                       | Leu<br>139<br>Ile<br>O<br>Phe<br>Gln<br>Leu                               | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe                    | Ser<br>Ile<br>Gly<br>Met<br>144!<br>Leu   | Val<br>Pro<br>Asp<br>143<br>Phe<br>5   | Val<br>Lys<br>141:<br>Val<br>O<br>Leu                                    | Glu<br>140<br>Leu<br>5<br>Asp<br>Pro                                   | 138:<br>Gln<br>O<br>Asn<br>Ile<br>Asp<br>Thr                       | Phe<br>Glu<br>His<br>Lys<br>145<br>Leu                  | Thr<br>Ile<br>Lys<br>143<br>Ile<br>0<br>Lys                             | Asn<br>His<br>1420<br>Leu<br>5<br>Ser                            | Val<br>1405<br>Leu<br>D<br>Lys<br>Leu<br>Gly                        | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470   | Pro Lys Val Gln 145! His                                  | Asn Pro Ile 1440 Tyr 5 Val  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln<br>Val                  | Ser Ile 1410 Ile 5 Lys Glu                                       | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn                             | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>1460<br>Leu     | Ser<br>Ile<br>Gly<br>Met<br>144!<br>Leu   | Val<br>Pro<br>Asp<br>143<br>Phe<br>5   | Val<br>Lys<br>141:<br>Val<br>O<br>Leu                                    | Glu<br>140<br>Leu<br>5<br>Asp<br>Pro<br>Lys                            | 138:<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>146:<br>Lys             | Phe<br>Glu<br>His<br>Lys<br>145<br>Leu                  | Thr<br>Ile<br>Lys<br>143<br>Ile<br>0<br>Lys                             | Asn<br>His<br>1420<br>Leu<br>5<br>Ser                            | Val<br>1405<br>Leu<br>O<br>Lys<br>Leu<br>Gly                        | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe  | Pro Lys Val Gln 145! His                                  | Asn Pro Ile 1440 Tyr 5 Val  |
| Leu<br>Arg<br>Pro<br>142:<br>Gln<br>Val                  | Ser Ile 1410 Ile Lys Glu Ser                                     | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147                      | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>146<br>Leu<br>5 | Ser<br>Ile<br>Gly<br>Met<br>144!<br>Leu   | Val Pro Asp 143 Phe Ser Leu  | Val<br>Lys<br>141:<br>Val<br>O<br>Leu<br>Asn                             | Glu<br>140<br>Leu<br>5<br>Asp<br>Pro<br>Lys<br>His<br>148              | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys             | Phe<br>Glu<br>His<br>Lys<br>145<br>Leu<br>5             | Thr<br>Ile<br>Lys<br>143<br>Ile<br>0<br>Lys<br>Ser                      | Asn<br>His<br>1420<br>Leu<br>Ser<br>Ser                          | Val<br>1405<br>Leu<br>Lys<br>Leu<br>Gly<br>Tyr<br>1489              | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe  | Pro Lys Val Gln 145! His                                  | Asn Pro Ile 1440 Tyr  Val Asn                                     |
| Leu<br>Arg<br>Pro<br>142:<br>Gln<br>Val                  | Ser Ile 1410 Ile Lys Glu Ser Tyr                                 | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile               | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>1460<br>Leu     | Ser<br>Ile<br>Gly<br>Met<br>144!<br>Leu   | Val Pro Asp 143 Phe Ser Leu  | Val<br>Lys<br>141:<br>Val<br>O<br>Leu<br>Asn<br>Ala                      | Glu<br>1400<br>Leu<br>5<br>Asp<br>Pro<br>Lys<br>His<br>148<br>Leu      | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys             | Phe<br>Glu<br>His<br>Lys<br>145<br>Leu<br>5             | Thr<br>Ile<br>Lys<br>143<br>Ile<br>0<br>Lys<br>Ser                      | Asn<br>His<br>1420<br>Leu<br>Ser<br>Ser<br>Asp                   | Val-<br>1405<br>Leu<br>Lys<br>Leu<br>Gly<br>Tyr<br>1489             | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe  | Pro Lys Val Gln 145! His                                  | Asn Pro Ile 1440 Tyr  Val Asn                                     |
| Leu Arg Pro 142: Gln Val Asn                             | Ser Ile 1410 Ile Lys Glu Ser Tyr 149                             | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile               | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>146<br>Leu<br>5 | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>Ile<br>Ser                           | Val Pro Asp 143 Phe 5 Ser Leu Thr  | Val<br>Lys<br>1419<br>Val<br>O<br>Leu<br>Asn<br>Ala<br>Asn<br>149        | Glu 140 Leu  Asp Pro Lys His 148 Leu 5                                 | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys<br>O        | Phe Glu His Lys 145 Leu 5                               | Thr Ile Lys 143 Ile 0 Lys Ser   | Asn His 1420 Leu Ser Ser Asp Trp 1500                            | Val-<br>1405<br>Leu<br>Lys<br>Leu<br>Gly<br>Tyr<br>1489<br>Ile      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe  | Pro Lys Val Gln 145! His O                                | Asn Pro Ile 1440 Tyr Val Asn Ile                                  |
| Leu Arg Pro 1422 Gln Val Asn Thr                         | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu                         | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile               | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>146<br>Leu<br>5 | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>Ile<br>Ser                           | Val<br>Pro<br>Asp<br>143<br>Phe<br>5<br>Ser<br>Leu<br>Thr                      | Val<br>Lys<br>141:<br>Val<br>0<br>Leu<br>Asn<br>Ala<br>Asn<br>149<br>Lys | Glu 140 Leu  Asp Pro Lys His 148 Leu 5                                 | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys<br>O        | Phe Glu His Lys 145 Leu 5                               | Thr Ile Lys 143 Ile O Lys Ser His                                       | Asn His 1420 Leu 5 Ser Ser Asp Trp 1500 Lys                      | Val-<br>1405<br>Leu<br>Lys<br>Leu<br>Gly<br>Tyr<br>1489<br>Ile      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe  | Pro Lys Val Gln 145! His O                                | Asn Pro Ile 1440 Tyr Val Asn Ile Glu                              |
| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150                 | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu 5                       | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile<br>O          | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys                   | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>O<br>Ile<br>Ser                      | Val<br>Pro<br>Asp<br>143<br>Phe<br>5<br>Ser<br>Leu<br>Thr<br>Ser<br>151        | Val Lys 1419 Val 0 Leu Asn Ala Asn 149 Lys                               | Glu<br>1400<br>Leu<br>5<br>Asp<br>Pro<br>Lys<br>His<br>148<br>Leu<br>5 | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys<br>O<br>Ala | Phe Glu His Lys 145 Leu Gly Fhe                         | Thr<br>Ile<br>Lys<br>143<br>Ile<br>O<br>Lys<br>Ser<br>His<br>Glu<br>151 | Asn His 1420 Leu Ser Ser Asp Trp 1500 Lys 5                      | Valled 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp                      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>Leu   | Pro Lys Val Gln 145! His His Gly                          | Asn Pro Ile 1440 Tyr S Val Asn Ile Glu 1520                       |
| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150                 | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu 5                       | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile<br>O          | 1380<br>Met<br>5<br>Leu<br>Thr<br>His<br>Phe<br>146<br>Leu<br>5 | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>O<br>Ile<br>Ser                      | Val<br>Pro<br>Asp<br>143<br>Phe<br>5<br>Ser<br>Leu<br>Thr<br>Ser<br>151        | Val Lys 1419 Val 0 Leu Asn Ala Asn 149 Lys                               | Glu<br>1400<br>Leu<br>5<br>Asp<br>Pro<br>Lys<br>His<br>148<br>Leu<br>5 | 1389<br>Gln<br>Asn<br>Ile<br>Asp<br>Thr<br>1469<br>Lys<br>O<br>Ala | Phe Glu His Lys 145 Leu Gly Fhe                         | Thr<br>Ile<br>Lys<br>143<br>Ile<br>O<br>Lys<br>Ser<br>His<br>Glu<br>151 | Asn His 1420 Leu Ser Ser Asp Trp 1500 Lys 5                      | Valled 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp                      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>Leu   | Pro Lys Val Gln 1459 His O His Gly Phe                    | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn                     |
| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150 Gly             | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu 5                       | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile<br>Met        | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys                   | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>Ile<br>Ser<br>Asp                    | Val<br>Pro<br>Asp<br>143<br>Phe<br>5<br>Ser<br>Leu<br>Thr<br>Ser<br>151<br>His | Val Lys 1419 Val Leu Asn Ala Asn 149 Lys O Met                           | Glu 140 Leu 5 Asp Pro Lys His 148 Leu 5 Gly                            | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile                        | Phe Glu His Lys 145 Leu Gly Phe Asn 153                 | Thr Ile Lys 143 Ile O Lys Ser His Glu 151 Leu 0                         | Asn His 1420 Leu 5 Ser Ser Asp Trp 1500 Lys 5                    | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp                      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>Leu<br>Trp                                  | Pro Lys Val Gln 1459 His Gly Phe 153                      | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn 5                   |
| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150 Gly             | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu 5                       | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile<br>Met        | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys                   | Ser<br>Ile<br>Gly<br>Met<br>144:<br>Leu<br>Ile<br>Ser<br>Asp                    | Val<br>Pro<br>Asp<br>143<br>Phe<br>5<br>Ser<br>Leu<br>Thr<br>Ser<br>151<br>His | Val Lys 1419 Val Leu Asn Ala Asn 149 Lys O Met                           | Glu 140 Leu 5 Asp Pro Lys His 148 Leu 5 Gly                            | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile                        | Phe Glu His Lys 145 Leu Gly Phe Asn 153                 | Thr Ile Lys 143 Ile O Lys Ser His Glu 151 Leu 0                         | Asn His 1420 Leu 5 Ser Ser Asp Trp 1500 Lys 5                    | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp                      | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>Leu<br>Trp                                  | Pro Lys Val Gln 1459 His Gly Phe 153                      | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn 5                   |
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| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150 Gly Ala         | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Tyr                 | Leu<br>139<br>Ile<br>Phe<br>Gln<br>Leu<br>Asn<br>147<br>Ile<br>Met<br>Ile | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys Thr               | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr                                    | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu                                | Val Lys 141: Val 0 Leu Asn Ala Asn 149 Lys 0 Met Leu                     | Glu 140 Leu Asp Pro Lys His 148 Leu Gly Phe                            | 1389 Gln Asn Ile Asp Thr 1469 Lys Ala Ile Ile Phe 154              | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His         | Thr Ile Lys 143 Ile O Lys Ser His Glu 151 Leu O Lys                     | Asn His 1420 Leu 5 Ser Ser Asp Trp 1500 Lys 5 Lys Gly            | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val                  | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>Leu<br>Trp<br>Phe<br>Gly<br>155             | Pro Lys Val Gln 1459 His Gly Phe 1530 Lys                 | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Ala             |
| Leu Arg Pro 1429 Gln Val Asn Thr Gln 150 Gly Ala         | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Tyr                 | Leu 139 Ile O Phe Gln Leu Asn 147 Ile O Met Ile Lys                       | 1380 Met 5 Leu Thr His Phe 146 Leu 5 Leu Lys Thr Thr 154 Cys    | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr                                    | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu                                | Val Lys 141: Val 0 Leu Asn Ala Asn 149 Lys 0 Met Leu                     | Glu 140 Leu Asp Pro Lys His 148 Leu Gly Phe Cys                        | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Ile Phe 154 Ser        | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His         | Thr Ile Lys 143 Ile O Lys Ser His Glu 151 Leu O Lys                     | Asn His 1420 Leu 5 Ser Ser Asp Trp 1500 Lys 5 Lys Gly            | Valled 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr              | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 1459 His Gly Phe 1530 Lys                 | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Ala             |
| Leu Arg Pro 1422 Gln Val Asn Thr Gln 150 Gly Ala Lys     | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Leu                 | Leu 139 Ile O Phe Gln Leu Asn 147 Ile O Met Ile Lys Glu 155               | 1380 Met 5 Leu Thr His Phe 146 Leu 5 Leu Thr Cys                | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr Asp                                | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu Met                            | Val Lys 141: Val 0 Leu Asn Ala Asn 149 Lys 0 Met Leu Asn                 | Glu 140 Leu Asp Pro Lys His 148 Leu Gly Phe Cys Thr                    | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Phe 154 Ser            | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His Asp     | Thr Ile Lys 143 Ile 0 Lys Ser His Glu 151 Leu 0 Lys                     | Asn His 1420 Leu Ser Ser Asp Trp 1500 Lys Lys Gly Leu            | Valled 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr Cys          | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 145! His Gly Phe 153: Lys Lys             | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Ala Glu         |
| Leu Arg Pro 1422 Gln Val Asn Thr Gln 150 Gly Ala Lys     | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Tyr Leu Ile         | Leu 139 Ile Phe Gln Leu Asn 147 Ile Met Ile Lys Glu 155 Asp               | 1380 Met 5 Leu Thr His Phe 146 Leu 5 Leu Lys Thr Thr 154 Cys    | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr Asp                                | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu Met                            | Val Lys 141: Val Leu Asn Ala Asn 149 Lys Met Leu Asn Trp                 | Glu 140 Leu Asp Pro Lys His 148 Leu Gly Phe Cys Thr 156 Lys            | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Phe 154 Ser            | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His Asp     | Thr Ile Lys 143 Ile 0 Lys Ser His Glu 151 Leu 0 Lys                     | Asn His 1420 Leu Ser Ser Asp Trp 1500 Lys Lys Gly Leu Lys        | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr Cys 1566 Val | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 145! His Gly Phe 153: Lys Lys             | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Ala Glu         |
| Leu Arg Pro 1422 Gln Val Asn Thr Gln 150 Gly Ala Lys Leu | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Leu Ile 157         | Leu 139 Ile Phe Gln Leu Asn 147 Ile Met Ile Lys Glu 155 Asp               | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys Thr Thr 154       | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr Asp Ser                            | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu Met Tyr                        | Val Lys 141: Val 0 Leu Asn Ala Asn 149 Lys 0 Met Leu Asn Trp 157         | Glu 140 Leu Asp Pro Lys His 148 Leu Cys Thr 156 Lys                    | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Phe 154 Ser O Ser      | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His Asp Met | Thr Ile Lys 143 Ile 0 Lys Ser His Glu 151 Leu 0 Lys Leu Ser             | Asn His 1420 Leu Ser Ser Asp Trp 150 Lys Lys Gly Leu Lys 158     | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr Cys 1560 Val | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 1459 His Ile Gly Phe 1530 Lys Lys Leu Leu | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Glu Glu Glu     |
| Leu Arg Pro 1422 Gln Val Asn Thr Gln 150 Gly Ala Lys Leu | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Leu Ile 157         | Leu 139 Ile Phe Gln Leu Asn 147 Ile Met Ile Lys Glu 155 Asp               | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys Thr Thr 154       | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr Asp Ser                            | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu Met Tyr                        | Val Lys 141: Val 0 Leu Asn Ala Asn 149 Lys 0 Met Leu Asn Trp 157         | Glu 140 Leu Asp Pro Lys His 148 Leu Cys Thr 156 Lys                    | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Phe 154 Ser O Ser      | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His Asp Met | Thr Ile Lys 143 Ile 0 Lys Ser His Glu 151 Leu 0 Lys Leu Ser             | Asn His 1420 Leu Ser Ser Asp Trp 150 Lys Lys Gly Leu Lys 158 Ala | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr Cys 1560 Val | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 1459 His Ile Gly Phe 1530 Lys Lys Leu Leu | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Glu Glu Glu Arg |
| Leu Arg Pro 1422 Gln Val Asn Thr Gln 150 Gly Ala Lys Leu | Ser Ile 1410 Ile Lys Glu Ser Tyr 149 Leu Tyr Tyr Leu Ile 157 Lys | Leu 139 Ile Phe Gln Leu Asn 147 Ile Met Ile Lys Glu 155 Asp               | 1380 Met 5 Leu Thr His Phe 1460 Leu 5 Leu Lys Thr Thr 154       | Ser Ile Gly Met 144! Leu Ile Ser Asp 152 Tyr Asp Ser                            | Val Pro Asp 143 Phe Ser Leu Thr Ser 151 His Leu Met Tyr                        | Val Lys 141: Val Leu Asn Ala Asn 149 Lys Met Leu Asn Trp 157 Ile         | Glu 140 Leu Asp Pro Lys His 148 Leu Cys Thr 156 Lys                    | 1389 Gln Asn Ile Asp Thr 1469 Lys O Ala Ile Phe 154 Ser O Ser      | Phe Glu His Lys 145 Leu Ile Gly Phe Asn 153 His Asp Met | Thr Ile Lys 143 Ile 0 Lys Ser His Glu 151 Leu 0 Lys Leu Ser             | Asn His 1420 Leu Ser Ser Asp Trp 150 Lys Lys Gly Leu Lys 158 Ala | Valleu 1405 Leu Lys Leu Gly Tyr 1489 Ile O Asp Val Tyr Cys 1560 Val | 1390<br>Cys<br>Met<br>Gln<br>Thr<br>Ser<br>1470<br>Phe<br>5<br>Leu<br>Trp<br>Phe<br>Gly<br>155<br>Val | Pro Lys Val Gln 1459 His Ile Gly Phe 1530 Lys Lys Leu Leu | Asn Pro Ile 1440 Tyr Val Asn Ile Glu 1520 Asn Asn Glu Glu Glu     |

Val Lys Gly Cys His Ser Phe Lys Leu Trp Phe Leu Lys Arg Leu Asn Val Ala Glu Phe Thr Val Cys Pro Trp Val Val Asn Ile Asp Tyr His Pro Thr His Met Lys Ala Ile Leu Thr Tyr Ile Asp Leu Val Arg Met 1640 1645 Gly Leu Ile Asn Ile Asp Arg Ile His Ile Lys Asn Lys His Lys Phe . 1655 Asn Asp Glu Phe Tyr Thr Ser Asn Leu Phe Tyr Ile Asn Tyr Asn Phe Ser Asp Asn Thr His Leu Leu Thr Lys His Ile Arg Ile Ala Asn Ser Glu Leu Glu Asn Asn Tyr Asn Lys Leu Tyr His Pro Thr Pro Glu Thr Leu Glu Asn Ile Leu Ala Asn Pro Ile Lys Ser Asn Asp Lys Lys Thr Leu Asn Asp Tyr Cys Ile Gly Lys Asn Val Asp Ser Ile Met Leu Pro Leu Leu Ser Asn Lys Lys Leu Ile Lys Ser Ser Ala Met Ile Arg Thr Asn Tyr Ser Lys Gln Asp Leu Tyr Asn Leu Phe Pro Met Val Val Ile Asp Arg Ile Ile Asp His Ser Gly Asn Thr Ala Lys Ser Asn Gln Leu Tyr Thr Thr Thr Ser His Gln Ile Ser Leu Val His Asn Ser Thr Ser Leu Tyr Cys Met Leu Pro Trp His His Ile Asn Arg Phe Asn Phe Val Phe Ser Ser Thr Gly Cys Lys Ile Ser Ile Glu Tyr Ile Leu Lys Asp Leu Lys Ile Lys Asp Pro Asn Cys Ile Ala Phe Ile Gly Glu Gly Ala Gly Asn Leu Leu Leu Arg Thr Val Val Glu Leu His Pro Asp Ile Arg Tyr Ile Tyr Arg Ser Leu Lys Asp Cys Asn Asp His Ser Leu Pro Ile Glu Phe Leu Arg Leu Tyr Asn Gly His Ile Asn Ile Asp Tyr Gly Glu Asn Leu Thr Ile Pro Ala Thr Asp Ala Thr Asn Asn Ile His Trp Ser Tyr Leu His Ile Lys Phe Ala Glu Pro Ile Ser Leu Phe Val Cys Asp Ala Glu Leu Ser Val Thr Val Asn Trp Ser Lys Ile Ile Ile Glu Trp Ser Lys His Val Arg Lys Cys Lys Tyr Cys Ser Ser Val Asn Lys Cys Met Leu Ile Val Lys Tyr His Ala Gln Asp Asp Ile Asp Phe Lys Leu Asp Asn Ile Thr Ile Leu Lys Thr Tyr Val Cys Leu Gly Ser Lys Leu Lys Gly Ser Glu Val Tyr Leu Val Leu Thr Ile Gly Pro Ala Asn Ile Phe Pro Val Phe Asn Val Val Gln Asn Ala Lys Leu Ile Leu Ser Arg Thr Lys Asn Phe Ile Met Pro Lys Lys Ala Asp Lys Glu Ser Ile Asp Ala Asn Ile Lys Ser Leu Ile Pro Phe Leu Cys Tyr Pro Ile Thr Lys 

| 2005   | 980       |
|--|-----------|
| Asp Ile Leu Ser Tyr Ser Ile Ala Gly Arg Asn Glu Val Phe Ser As<br>2085 2090 2095 | sn .      |
| Lys Leu Ile Asn His Lys His Met Asn Ile Leu Lys Trp Phe Asn His 2100 2105 2110   | is        |
| Val Leu Asn Phe Arg Ser Thr Glu Leu Asn Tyr Asn His Leu Tyr Me<br>2115 2120 2125 | et .      |
| Val Glu Ser Thr Tyr Pro Tyr Leu Ser Glu Leu Leu Asn Ser Leu Th<br>2130 2135 2140 | nr ·      |
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| verso Architetar beg  | .uenee  |   |   |    |
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| <223> Oligonucleotid  | le      |   | • |    |
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| <223> Oligonucleotic  | de      |   |   | ·  |
| -                     |         | _ |   |    |
| <400> 39              |         | • | • | •  |
|                       | ct a    |   |   | 21 |
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|   | <211> 18                               | ٠.  |
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|   | V2137 ALCITICIAT Dequence              |     |
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